

### **REMARKS**

Claims 1, 5 and 18 are amended herein. Upon entry of this amendment, claims 1-18 and 27-34 will be pending in the above-identified application.

Applicant gratefully acknowledges the allowability of claims 5, 30 and 33. The scope of claim 5 has been broadened by the amendment made herein.

#### Drawing Objection

Applicant respectfully requests reconsideration of the rejection of the drawing under 37 C.F.R. § 1.83(a). A proposed drawing amendment is enclosed. The amendment adds the numerical designation 108 to the drawing. The corresponding portion of the specification is likewise amended to make clear the location of the terminals. Accordingly, the Rule 83 objection has been overcome and applicant requests it be withdrawn.

#### Section 112

Applicant requests reconsideration of the rejection of claim 18 under 35 U.S.C. § 112, second paragraph. The claim has been amended to clarify that the dielectric constant is suitable for operating at an operational frequency between about 2 GHz and about 10 GHz. Accordingly, the Section 112 rejection has been overcome and applicant requests it be withdrawn.

#### Section 103 - Claims 1-4, 7-12 and 14

Applicant requests reconsideration of the rejection of claims 1-4, 7-12 and 14 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,462,405 (Lai) in view of U.S. Patent No. 5,023,624 (Heckaman).

As a preliminary matter, it is noted claim 8 depends from claim 5 which was previously identified as being allowable.

Each of the claims recites a near-hermetic microwave semiconductor device comprising: a substrate; a Monolithic Microwave Integrated Circuit (MMIC) disposed on said substrate; a sealant disposed on said MMIC; and a Backside Interconnect which connects said substrate to said sealant-coated MMIC, includes plated-through vias disposed on said MMIC, and ties to terminals on said substrate.

As discussed in the Office Action, Lai discloses a semiconductor device comprising a substrate (40), an integrated circuit (41) disposed on the substrate, and a lid (43) disposed on the integrated circuit. The Office Action alleges Lai discloses an interconnect as claimed at column 4 lines 14-20, but the cited portion of the reference describes vias extending between opposite surfaces of the substrate. These vias are not a Backside Interconnect connecting the substrate to the MMIC, including plated-through vias disposed on said MMIC, and ties to terminals on the substrate as claimed.

Heckaman also fails to disclose a Backside Interconnect as claimed. Thus, the references, taken separately or together, fail to disclose or suggest all of the features recited in the claims. Accordingly, the Section 103 rejection is improper and should be withdrawn.

#### Section 103 - Claims 15 and 16

Applicant requests reconsideration of the rejection of claims 15 and 16 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,525,420 (Zuo) in view of U.S. Patent No. 6,710,542 (Chun).

Each of the claims recites a near-hermetic device comprising: a substrate; an electronics package disposed on said substrate; a sealant disposed on said electronics package; a Backside Interconnect which connects said substrate to said sealant-coated electronics package; and an interlayer dielectric disposed between said sealant and said electronics package.

As discussed in the Office Action, Zuo discloses a device comprising a substrate (7), and an electronics package (9) disposed on said substrate. Contrary to the assertion made in the Office Action, Zuo fails to disclose a sealant disposed on the electronics package as claimed or a Backside Interconnect which connects the substrate to the sealant-coated electronics package as claimed. Zuo also fails to disclose an interlayer dielectric disposed between the sealant and the electronics package as claimed.

The Office Action alleges Chun discloses a sealant disposed on the electronics package as claimed and an interlayer dielectric disposed between the sealant and the electronics package as claimed. However, Chun also fails to disclose

or suggest a Backside Interconnect which connects the substrate to the sealant-coated electronics package as claimed. Thus, the references, taken separately or together, fail to disclose or suggest all of the features recited in the claims. Accordingly, the Section 103 rejection is improper and should be withdrawn.

Section 103 - Claims 6, 27-29, 31, 32 and 34

Applicant requests reconsideration of the rejection of claims 6, 27-29, 31, 32 and 34 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Zuo in view of Chun and Heckaman.

Each of the claims recites a near-hermetic microwave semiconductor device comprising: a substrate; a Monolithic Microwave Integrated Circuit (MMIC) disposed on said substrate; a sealant disposed on said MMIC; and a Backside Interconnect connecting said substrate to said sealant-coated MMIC, wherein said sealant is disposed over benzocyclobutene (BCB) as an interlayer dielectric.

As discussed above, Zuo discloses a semiconductor device comprising a substrate (7). However, Zuo does not disclose or suggest a MMIC disposed on the substrate, a sealant disposed on the MMIC, or a Backside Interconnect connecting the substrate to the MMIC, wherein said sealant is disposed over BCB as an interlayer dielectric.

As pointed out the Office Action, Chun discloses a sealant (22) disposed over BCB (21). However, like Zuo, Chun does not disclose or suggest a MMIC disposed on the substrate, a sealant disposed on the MMIC, or a Backside Interconnect connecting the substrate to the MMIC. Heckaman discloses an MMIC, but does not disclose or suggest a sealant disposed on the MMIC or a Backside Interconnect connecting the substrate to the MMIC. Thus, none of the references taken together or alone disclose or suggest a sealant disposed on the MMIC or a Backside Interconnect connecting the substrate to the MMIC. Because the references fail to disclose or suggest all of the features recited in the claims, the Section 103 rejection is improper and should be withdrawn.

Section 103 - Claim 17

Applicant requests reconsideration of the rejection of claim 17 under 35 U.S.C. § 103(a) as being unpatentable over Lai in view of U.S. Patent No. 4,814,943 (Okuaki).

Claim 17 recites near-hermetic microwave semiconductor device, comprising: a substrate; a Monolithic Microwave Integrated Circuit (MMIC) disposed on said substrate; a sealant disposed on said MMIC; a Backside Interconnect which connects said substrate to said sealant-coated MMIC; a conformal coating disposed on said sealant; and a cover disposed on said device without directly contacting said coating.

As discussed in the Office Action, Lai discloses a semiconductor device comprising a substrate (40), an integrated circuit (41) disposed on the substrate, and a lid (43) disposed on the integrated circuit. The Office Action also suggests Lai discloses an interconnect as claimed at column 4 lines 14-20. However, the cited portion of the reference describes vias extending between opposite surfaces of the substrate. These vias are not a Backside Interconnect connecting the substrate to the MMIC. The Office Action points out Okuaki discloses a cover disposed on the device without directly contacting the coating. However, Okuaki does not disclose or suggest a Backside Interconnect as claimed. Because none of the references, taken alone or in combination, disclose or suggest the Backside Interconnect as claimed, the Section 103 rejection is improper and should be withdrawn.

Section 103 - Claim 13

Applicant requests reconsideration of the rejection of claim 13 under 35 U.S.C. § 103(a) as being unpatentable over Lai and Heckaman and further in view of Okuaki.

Claim 13 recites a near-hermetic microwave semiconductor device comprising: a substrate; a Monolithic Microwave Integrated Circuit (MMIC) disposed on said substrate; a sealant disposed on said MMIC; and a Backside Interconnect which connects said substrate to said sealant-coated MMIC, includes plated-through vias disposed on said MMIC, and ties to terminals on said substrate.

As discussed above, Lai discloses a semiconductor device comprising a substrate (40), an integrated circuit (41) disposed on the substrate, and a lid (43) disposed on the integrated circuit. However, Lai, Heckaman and Okuaki fail to disclose an interconnect as claimed. Thus, the references taken alone or in combination fail to disclose or suggest all of the claim elements. Therefore, the Section 103 rejection is improper and should be withdrawn.

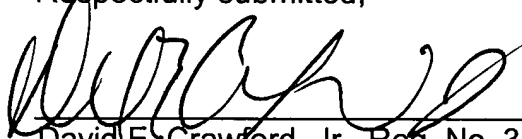
### **Conclusion**

If the Examiner believes that there is any issue which could be resolved by an interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

As it is believed the application is in condition for allowance, a favorable action and Notice of Appeal are respectfully requested.

Dated: January 11, 2005

Respectfully submitted,

A handwritten signature in black ink, appearing to read "David E. Crawford, Jr.", written over a horizontal line.

David E. Crawford, Jr., Reg. No. 38,118  
Customer No. 26263  
314.259.5810

**In the Drawings:**

Enclosed is a copy of the drawing figure showing proposed changes in red. Also enclosed is a Replacement Sheet of the formal drawing incorporating the proposed changes.

